REMARKS

Claims 1-23 are pending. By this amendment, claim 1 is amended for clarity purposes only. Support for the amendment is provided in at least Figure 5 of the present application. Reconsideration of the rejected claims in view of the below remarks is respectfully requested. This Response is fully responsive and meets the requirements of MPEP §§714.02 and 714.04.

As an initial matter, Applicant respectfully requests that the status of the Drawings be indicated in the next Office communication, in view of the remarks noted in the previous Amendment filed May 6, 2005.

Rejections under 35 U.S.C. 103(a)

In the outstanding Office Action, claims 1-3, 8, 11-17, 19 and 20 are rejected under 35 U.S.C. 103(a) over USPN 5,167,442 to ALAZE et al. (herein "ALAZE") in view of WO 95/19282 to HALL and USPN 6,086,515 to BUSCHMANN et al (herein "BUSCHMANN"). Claims 4-7, 18, 21 and 23 are rejected under 35 U.S.C. 103(a) over ALAZE in view of HALL, BUSCHMANN, and USPN 5,771,933 to AKAMATSU et al (herein "AKAMATSU"). Claims 1-3, 8, 9, 14-17, 19 and 20 are rejected under 35 U.S.C. 103(a) over JP 2001-225731 to TAKAYUKI et al. (herein "TAKAYUKI") in view of HALL and BUSCHMANN. Claims 4-7, 10-13, 18, 21 and 23 are rejected under 35 U.S.C. 103(a) over TAKAYUKI in view of HALL and BUSCHMANN, and further in view of AKAMATSU et al. These rejections are respectfully traversed.

Rejections in view of Alaze with Hall and Buschmann

It is respectfully submitted that the rejections in view of ALAZE, HALL and BUSCHMANN do not establish a *prima facie* case of obviousness, because not all the

features of the pending claims are taught or suggested by the cited references. MPEP § 2143.03 states:

> To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

The References Do Not Show
the Features of the Claimed Invention

As previously discussed, in the system of the invention, when the operator disengages the brake pedal, the brake fluid pressure that was previously transmitted to the wheel brake is temporarily maintained by the closing of the normally-open electromagnetic valve. Thereafter, after the operator disengagesthe break pedal, the brake pressure can be gradually reduced by controlling the current to the solenoid of the electromagnetic valve.

More specifically, in a non-limiting example of the invention, in order to maintain the brake fluid pressure after removal of the braking operation, in case where there is generated a given attracting force due to application of a current to the electromagnetic coil to thereby close the normally-open-type electromagnetic valve, the movable core 41 (see FIG. 1) is moved in the approaching direction to the fixed core against the pressure energizing force of the valve opening energizing spring. Because of the closed state of the normally-open-type electromagnetic valve, even after removal of the braking operation, e.g., release of the stepping on the brake pedal, the brake fluid pressure of the wheel brake can be maintained. Also, the value of a current to be applied to the

electromagnetic coil can be slightly lowered after the brake fluid pressure of the wheel brake is lowered, to thereby slightly reduce the attracting force acting on the movable core, such that the brake fluid pressure of the wheel brake 4 becomes higher than the attracting force that can close the normally-open-type electromagnetic valve, so that it is opened and the brake fluid pressure of the wheel brake 4 is further lowered. Therefore, by gradually lowering the current value to reduce the attracting force little by little, the brake fluid pressure of the wheel brake 4 can be lowered down gradually (see the specification at page 34, line 16, through page 35, line 21).

However, ALAZE, HALL and BUSCHMANN instead relate to traction control or anti-skid systems in which brakes are effectuated entirely independently of an operator—for example, in response to detection of loss of traction during driving, as discussed in HALL at page 1, line 22 *et seq.*, which discloses auxiliary pressure pumps that act "independently of the operation of a brake pedal ... and are typically isolated from the master cylinder of the brake system." Therefore, ALAZE, HALL and BUSCHMANN merely relate to traction control systems which function independently of a braking operation, and thus do not disclose, singularly or in combination, a brake fluid maintaining apparatus including, amongst other features of claim 1:

> "a normally-open electromagnetic valve closable in order to temporarily maintain the brake fluid pressure of the wheel brake even after release of stepping on the brake penal,"

Furthermore, none of ALAZE, HALL or BUSCHMANN, either singly or in any proper combination thereof, disclose a normally-open electromagnetic valve which has a "relief function" that includes changing an attracting force for closing the normally-open electromagnetic valve by changing the value of the current to be applied to an electromagnetic coil, in order to temporarily maintain the brake fluid pressure of the wheel brake even after releasing of the stepping on the brake pedal.

In contrast to the invention, BUSCHMANN merely discloses a traction slip control operation using a "pump 12" separated from a "master cylinder 1" by a "separating valve 15." In BUSCHMANN, at column 2, line 65 *et seq.*, an "electronic controller 17" furnishes braking pressure control signals based on input from signal lines relating to vehicle speed, brake light switch. However, BUSCHMANN does not disclose or suggest that "by changing the value of the current to be applied to the electromagnetic coil, an attracting force for closing the normally-open electromagnetic valve is changed," nor that "when the normally-open electromagnetic valve is closed due to application of a current to the electromagnetic coil, in case where the brake fluid pressure of the wheel brake is higher than the attracting force of the given value, the normally-open electromagnetic valve is opened against the attracting force to thereby reduce the brake fluid pressure of the wheel brake down to the given value," as recited in independent claim 1.

HALL merely discloses use of a single "pre-selected level" of current supplied to a valve 32. However, the provision of a current at a "pre-selected level" is fundamentally different from "changing the value of the current to be applied to the electromagnetic coil," as recited in pending independent claim 1, for example.

Independent claim 1 also recites, *inter alia*,

> ... a check valve interposed between the master cylinder and a wheel brake operatable by the brake fluid pressure from the master cylinder for allowing the flow of the brake fluid pressure from the master cylinder to the wheel brake in a braking operation, *{and}*
>
> a normally-open electromagnetic valve closable in order to temporarily maintain the brake fluid pressure of the wheel brake even after release of stepping on the brake pedal ...

In a non-limiting example, FIG. 4 shows that in between a master cylinder and a wheel brake, there is connected and interposed a brake fluid pressure maintaining apparatus. The brake fluid pressure maintaining apparatus comprises a check valve

which, in the braking operation, allows the brake fluid pressure to flow from the master cylinder to the wheel brake, and a normally-open-type electromagnetic valve 6 which, even after release of the stepping on the brake pedal, can be closed so as to temporarily maintain the brake fluid pressure of the wheel brake. As an advantage, this normally-open-type electromagnetic valve has not only a brake fluid pressure maintaining function but also a relief mechanism which, when the brake fluid pressure of the wheel brake 4 is excessively high, returns the brake fluid pressure of the wheel brake 4 to the master cylinder (see the specification at page 23, line 12, through page 24, line 6).

By contrast, neither ALAZE nor HALL are directed to brake fluid maintaining apparatuses in which brake fluid pressure is temporarily maintained following release of a brake pedal, for example. Rather, ALAZE and HALL are directed to traction-control or anti-skid mechanisms that operate independently of any brake pedal engagement by a driver. For example, ALAZE at column 1, lines 6-9 and column 3, lines 10-14, merely discloses a "traction control operation." HALL at page 6, line 6 *et seq.*, merely discloses a "traction slip control maneuver" that causes a wheel brake 20 to bear against wheel disk 22 in response to spinning of wheel disk 22 in an undesirable fashion, instead of maintaining brake fluid pressure after release of the stepping on the brake pedal. As such, neither ALAZE nor HALL can properly be compared to the features recited in independent claim 1 of "a normally-open electromagnetic valve closable in order to temporarily maintain the brake fluid pressure of the wheel brake even after release of stepping on the brake pedal," and BUSCHMANN also does not teach or suggest such features.

For example, ALAZE merely discloses a "shutoff valve 15" that "has an open position 15a, which can be generated by spring actuation," and "a closing position 15b," in which "the shutoff valve 15 divides a flow of pressure fluid between a line segment 13.1 of the line 13 toward the master brake cylinder and a line segment 13.2 of this line

toward the wheel brake" (see ALAZE at column 2, lines 17 through 37). Also, a "pressure source 30 in the form of a high-pressure pump is also connected to the line segment 13.2. In traction control operation, during which the shutoff valve 15 is switched into its closing position 15b, the pressure source 30 is capable of feeding pressure fluid into the line 13" (see ALAZE at column 3, lines 9 through 19).

Further, HALL merely discloses that in a traction slip control maneuver, an "increase in pressure within brake conduit 18 is accomplished by closing isolation valve 32 and activating auxiliary pump 30. Auxiliary pump 30 has its suction side opposite the connection to conduit 18 such that an increase in brake fluid pressure is build (sic) up within conduit 18 causing wheel brake 20 to bear against wheel disk 22" (see HALL at page 6, lines 6-26).

Thus, the systems of ALAZE and HALL only disclose that a shutoff valve or isolation valve isolates pressure generated by a pump located beyond the shutoff valve or isolation valve, and in which the pressure isolated thereby is generated by the pump (instead of by the flow of pressure from a master brake cylinder). In contrast to the features recited in pending independent claim 1, neither ALAZE nor HALL teach or suggest at least

> "a check valve ... allowing the flow of the brake fluid pressure from the master cylinder to the wheel brake in a braking operation" and "a normally-open electromagnetic valve closable in order to temporarily maintain the brake fluid pressure of the wheel brake even after release of stepping on the brake pedal."

Moreover, BUSCHMANN merely discloses determining vehicle speed, brake pedal application, and the like, but does not teach or suggest the above-noted features recited in independent claim 1.

Accordingly, it is respectfully submitted that independent claim 1, and each of the claims depending therefrom, are patentably distinguishable over ALAZE, HALL and BUSCHMANN. Thus, it is respectfully submitted that a *prima facie* case of obviousness has not been made because not all of the features recited in at least pending independent claim 1 are taught or suggested by ALAZE, HALL and BUSCHMANN.

The Combination of References is Improper

It is respectfully submitted that the outstanding rejection is improper at least because HALL violates a principle of operation of ALAZE; and that ALAZE, HALL and BUSCHMANN cannot properly be combined in the manner suggested in the outstanding Office Action.

In particular, ALAZE at column 4, line 17 *et seq.* discloses only an "on/off"-type control of current to the coil 56, and that spring force from a compression spring 64 or restoring spring 40 substantially mechanically isolates the electromagnetic force from the pressure of line 13. This mechanical isolation is fundamental to ALAZE in order for the two modes of operation (*e.g.*, closed and open modes) discussed in ALAZE to function correctly, and thus is a principle of operation of ALAZE. Therefore, any increase or decrease in the electromagnetic mechanical force generated by current supplied to the coil 56 of ALAZE would not propagate in proportion to the current.

In contrast, however, HALL discloses at page 7, line 15 *et seq.* that the "holding pressure of isolation valve 32 is proportional to the energizing current supplied to solenoid 34." Accordingly, because HALL states that holding pressure is proportional to the energizing current, while it is a principle of operation of ALAZE that pressure generated by electromagnetic force from current supplied to the coil 56 thereof is isolated by a compression spring 64 or restoring spring 40, it is respectfully submitted that combining HALL and ALAZE in the manner suggested in the outstanding Office Action would violate at least the above-noted principle of operation of ALAZE.

Accordingly, for each of the above-noted reasons, it is respectfully requested the rejections in view of ALAZE, HALL and BUSCHMANN noted in the outstanding Office Action be withdrawn.

Rejections in view of Takayuki with Hall and Buschmann

TAKAYUKI merely discloses a "valve chest 34" communicated with liquid pressure passages, in which the abstract cites a "Problem to be Solved" as "To provide a brake fluid pressure control device for a vehicle with a normally-open solenoid valve between a master cylinder and a wheel brake for allowing the closing of the valve when temporarily holding a brake fluid pressure for the wheel brake after canceling braking operation..." However, TAKAYUKI does not teach or suggest at least "changing the value of the current to be applied to the electromagnetic coil," *inter alia*, as recited in independent claim 1, for example.

Rejection of Dependent Claims 4-7, 10-13, 18, 21 and 23

Applicant submits that the remaining dependent claims are allowable at least for the reason that these claims depend from allowable base claims.

Furthermore, it is respectfully submitted that AKAMATSU also fails to teach or suggest "changing the value of the current to be applied to the electromagnetic coil," *inter alia*, as recited in independent claim 1, for example.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejections of the above-noted claims under 35 U.S.C. 103(a) for each of the pending claims.

Independent claim 14 and the claims depending therefrom

In addition, it is noted that independent claim 14 is drafted to be interpreted under 35 USC § 112, sixth paragraph. As discussed above, ALAZE, HALL, BUSCHMANN, TAKAYUKI and AKAMATSU do not disclose the features of this claim. Accordingly, it is respectfully submitted pending independent claim 14 and each of the claims depending therefrom also patentably distinguish over the cited references, at least for reasons similar to those discussed regarding pending independent claim 1; and it is respectfully requested the rejections thereof also be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 19-0089.

Respectfully submitted,
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